

trating on larger prey items. If large struggling tadpoles take much more energy to manipulate into the mouth than small tadpoles, then a naiad would benefit in an energy budget by concentrating on smaller prey items. To our knowledge, the relative energy budgets involved in prey capture by naiads are unknown.

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Notched Teeth from the Texas Panhandle

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ABSTRACT

Mutilated human teeth from prehistoric North America have previously been reported from relatively late prehistoric sites in areas of well-known Mesoamerican influence. Recently 2 examples of probably filed teeth have been found in sites from the Texas Panhandle, an area not known for Mesoamerican influence. In addition, the skeletons could be considerably older than those previously reported, perhaps from the Archaic period.

The presence in prehistoric Mesoamerica of a wide-spread custom of tooth mutilation involving various types of notches and grooves has been known for a long time and now is well documented (Romero, 1970). However, not until 1944, when a series of 4 articles began appearing in this *Journal*, was clear evidence presented that the custom had made its way into prehistoric America north of Mexico. Although there was

an early mention of the finding of notched teeth at Sikyatki Pueblo, Arizona (Saville 1913: 378, footnote 1), Campbell (1944) was the first to describe the teeth in full. The same year Stewart and Titterington reported 1 labially grooved and several occlusally notched teeth from Cahokia and vicinity in Illinois. Additional examples were described later from Macon, Georgia (Stewart and Titterington, 1946: 259-260), the Dickson Mound in Illinois

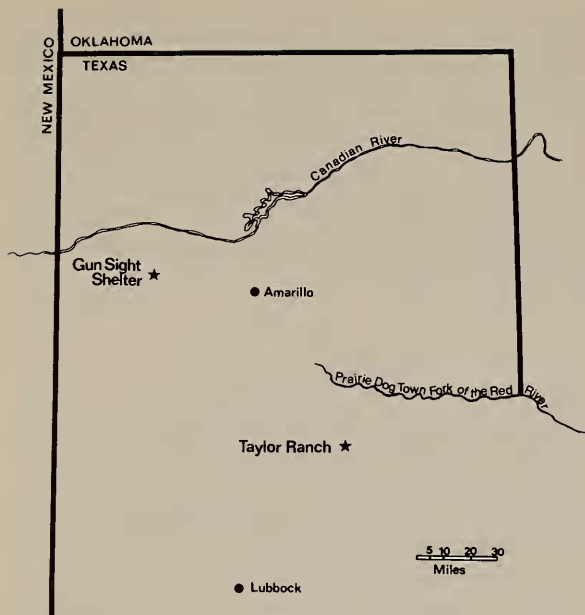


Fig. 1.—Texas Panhandle showing the locations of the Taylor Ranch Site and Gun Sight Shelter.

(Stewart and Titterington, 1946: 260–261), the Rees Site near Cahokia, Illinois (Holder and Stewart, 1958: 349–356), and from Cahokia itself (Holder and Stewart, 1958: 356). Stewart summarized all these finds in his book (1973: 193), noting that they all came from archeological contexts, suggesting a late prehistoric time period and substantial Mesoamerican influence.

As one might expect, the highly visible anterior teeth are those most often modified. Among the specimens described in the publications mentioned, the central incisors are most common, the lateral incisors next most common, and the canines least common (actually only 1 has been reported). The mutilations thus far reported are of the simplest of forms: 1 or more V-shaped notches filed into the occlusal surface and/or a transverse labial groove. The labial groove is easily confused with defective enamel resulting from hypoplasia.

Recently 2 Indian skeletons with notched teeth were recovered through the careful excavation of 2 different burials in the Texas Panhandle, an area with no other evidence of direct Mesoamerican influence. In addition, both discovery sites possibly date from the Archaic Period, which, if confirmed,

would add considerably to the known antiquity of the custom in North America. Our purpose here is to present the provenience, description, and implications of the new finds.

Taylor Ranch Burial

The Taylor Ranch Burial (Panhandle-Plains Historical Museum Site A-1063; Burial 1) was found about Christmas 1972 by the ranch-owner, Walter Taylor, 6 air mi southwest of Quitaque, Texas (Fig. 1). Taylor and his daughter partially excavated the burial in July 1973 and then notified Dr. Jack T. Hughes, Department of Geology and Anthropology, West Texas State University, Canyon, and Mr. Billy R. Harrison, Panhandle-Plains Historical Museum. On July 27, 1973, Hughes and Harrison (Hughes' field notes for that date filed with the Panhandle-Plains Historical Museum) were given the bones already removed (left arm, leg, innominate, and scapula), were guided to the burial location, and were allowed to expose and remove the rest of the burial. The bones were removed in clumps which included the dirt matrix and were transferred to West Texas State University, where in November of 1974 they were processed by a field archeology class under the direction of the first author. It was then that the notched incisors were discovered by Mr. Billy Pat Newman, a student in the class. The skull and mandible were shipped to the second author for inspection but were later returned and are now housed in the Panhandle-Plains Historical Museum.

According to Hughes (field notes), the burial was exposed in the side of a deep sinkhole (Fig. 2) in a colluvial bench of North Pole Creek. The sinkhole occurred where the colluvial bench joined a bedrock cliff at the neck of a long narrow meander, and in all probability the 40-yard-long sinkhole was caused by underground drainage across the neck of land. The bench consisted of a compact light pink sand colluvium which, as indicated by the sinkhole's

profile, was at least 24.5 ft thick. The skeleton was exposed in a vertical side of the sink 12.5 ft from the bottom of the hole, 12 ft from the top, and although the pit was not clearly delineated, the skeleton was most likely buried from a surface 2.5 ft above the bottom of the grave. Above the pit bottom 1.9 ft were two large sandstone slabs, the most common rock in the area (Fig. 3), and at 2.5 ft a smaller sandstone rock seemingly indicated the surface from which the grave was dug. The surface was vaguely marked there and elsewhere in the exposure by a line of differential erosion. Both below and above the old surface, the colluvium was massive, suggesting rapid accumulation both before and after the formation of the old, weathered surface. However, this rapidly accumulated colluvium does not rule out considerable antiquity of the burial. Hughes (personal communication) believes the burial is probably Archaic, although this

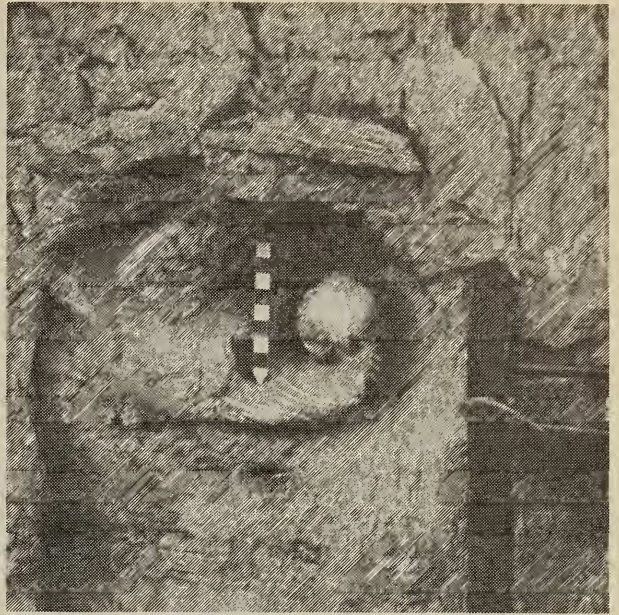


Fig. 3.—Taylor Ranch Burial. Note the 2 large sandstone slabs above the skeleton and above them a line of differential erosion which apparently indicates the surface from which the grave was dug. View is south. Photograph courtesy of Jack T. Hughes.



Fig. 2.—Partially excavated Taylor Ranch Burial in side of sinkhole. The skeleton is approximately 12 ft from the top and 12 ft from the bottom of the sink. View is to the southwest. Photograph courtesy of Jack T. Hughes.

antiquity is difficult to prove due to the lack of associated artifacts.

The skeleton was apparently placed in a small oval-shaped, shallow pit, measuring 2.25 ft east-west, at least 1.25 ft north-south, and as noted above, probably 2.5 ft deep. The individual was lying on its back, legs tightly flexed upward and to the left, arms semi-flexed with the hands near the pelvic region, head to the west but facing southeast (Fig. 4). In addition to the 3 sandstone rocks mentioned above, 5 burned sandstone cobbles were on top of the chest and pelvis, a Tecovas jasper flake was south (right) of the pelvis, and several small shells (*Succinea?*) and scattered charcoal flecks occurred throughout the pit-fill. The sandstone cobbles were likely intentionally interred with the person; the flake, shells, and charcoal may have been there fortuitously. Other than the depth below ground level, the burial is like many other Indian interments from the area.

The bones of the Taylor Ranch Burial are in a fair state of preservation; most of the bone shafts are intact, but the ends are commonly missing and none—even those reconstructed—is complete.



Fig. 4.—Close-up of the Taylor Ranch Burial *in situ*. The skeleton is lying on its back, leg flexed upward and to the left, head to the west but facing southeast. View is to the south. Photograph courtesy of Jack T. Hughes.

All bones are stained pink, typical of the effects of extended contact with the red Triassic or Permian soils or soils derived from either of these. Isolated charcoal stains occur on 2 cervical vertebrae, the greater trochanter of the left femur, and the left fifth metatarsal. Rather than being the marks of *in situ* burning, the charcoal stains appear to represent sites of contact with small charcoal pieces in the soil since the marks are small, homogeneously colored, and do not penetrate to the interior cancellous bone.

The skull was recovered intact but came apart during cleaning. It was easily repaired with minimum warpage. In addition to the skull and mandible, most of the other major bones are represented including parts of all major limb bones (except the left humerus) as well as many bones of the hands, feet, chest, and pelvis. There are no indications that more than 1 person is present.

The skeletal remains suggest a female. The pubic region, sciatic notch, femur

head diameter, and the general lack of robusticity all support this identification.

There can also be little doubt concerning the race of the individual. The shovel-shaped incisors and flat face suggest that the person was Mongoloid. These morphological observations coupled with inferences made from the archeologic and geologic contexts indicate the person was American Indian.

Age was estimated from the degree of epiphyseal union, suture closure, pubic symphysis change, and tooth wear. All of the criteria indicate a person in the 16 to 22 yr age range with the exception of Gilbert and McKern's method for female pubic symphysis aging, which suggested a greater range but include the years mentioned above. This last method is most appropriate for aging older females.

All teeth are present except the left maxillary third molar and both mandibular third molars which appear to be congenitally missing. All teeth display some crown loss due to attrition, especially the

first molars. Notches occur in the center of the labial incisal edge of the mandibular and maxillary central incisors (Figs. 5, 6). The notches are V-shaped, located centrally in the maxillary incisors and slightly right of center in the mandibular incisors. In all cases the borders of the notches are clear-cut and sharply defined. The notches on the mandibular teeth are slightly closer together than on the maxillary teeth. Thus with the mandible and maxilla in occlusion, the notches do not exactly match. Also the paired notches themselves do not correspond in size. Both maxillary notches are much wider than those of the mandible. Originally the notches may have been more apparent since the incisor crowns have been reduced at least 1 millimeter by attrition.

Burial From The Gun Sight Shelter

The Gun Sight Shelter, (Panhandle-Plains Historical Museum Site A-1203), located near Vega, Texas (Fig. 1), was excavated by Mr. Billy Ray Thompson of Amarillo, Texas. He is affiliated with the Panhandle-Plains Historical Museum in Canyon, Texas, and performed most of the work with volunteer amateur archeologists during the spring and summer of 1974. The artifacts he collected have been processed, and a report is being prepared which will describe the burial and its context more fully. However, preliminary information indicates that the shelter contains mostly Archaic and NeoIndian cultural remains and was inhabited between 1500 B.C. and 1400 A.D.

The skeletal parts were badly disturbed by burrowing animals, with most of the bones badly fragmented, but nearly all major bones are present. From initial impressions, the individual appears to be an adult male.

Teeth present include from the mandible: incisors (4), right canine (1), right premolars (2), and right molars (3); from the maxilla: a central incisor (1), lateral incisors (2), left canine (1), premolars (2), and both first molars (2), for a total of



Fig. 5.—Front view of the Taylor Ranch skull and mandible showing the notched teeth. The skull is not oriented in the Frankfort Plane.

18 teeth. Notches occur on the mandibular central incisors and right lateral incisor (Fig. 7). The left central incisor has the most pronounced notch, which is V-shaped and extends from the labial margin of the occlusal surface lingually four-fifths of the diameter of the crown; the notch is deepest on the labial aspect from where it tapers lingually. The alteration on each of the other 2 mandibular incisors consists of little more than a slight groove in the middle of the labial half of the occlusal surface. Similarly, a slight indentation occurs on the left labial edge of the occlusal surface of what may be a left lateral maxillary incisor.

All of the teeth display extensive crown reduction due to attrition. In particular the mandibular teeth displaying the grooves have no crowns remaining whatsoever, which is not uncommon in middle-aged adult Indians from the region. The grooves occur in the secondary dentine and root stumps. Another sort of alteration occurs on

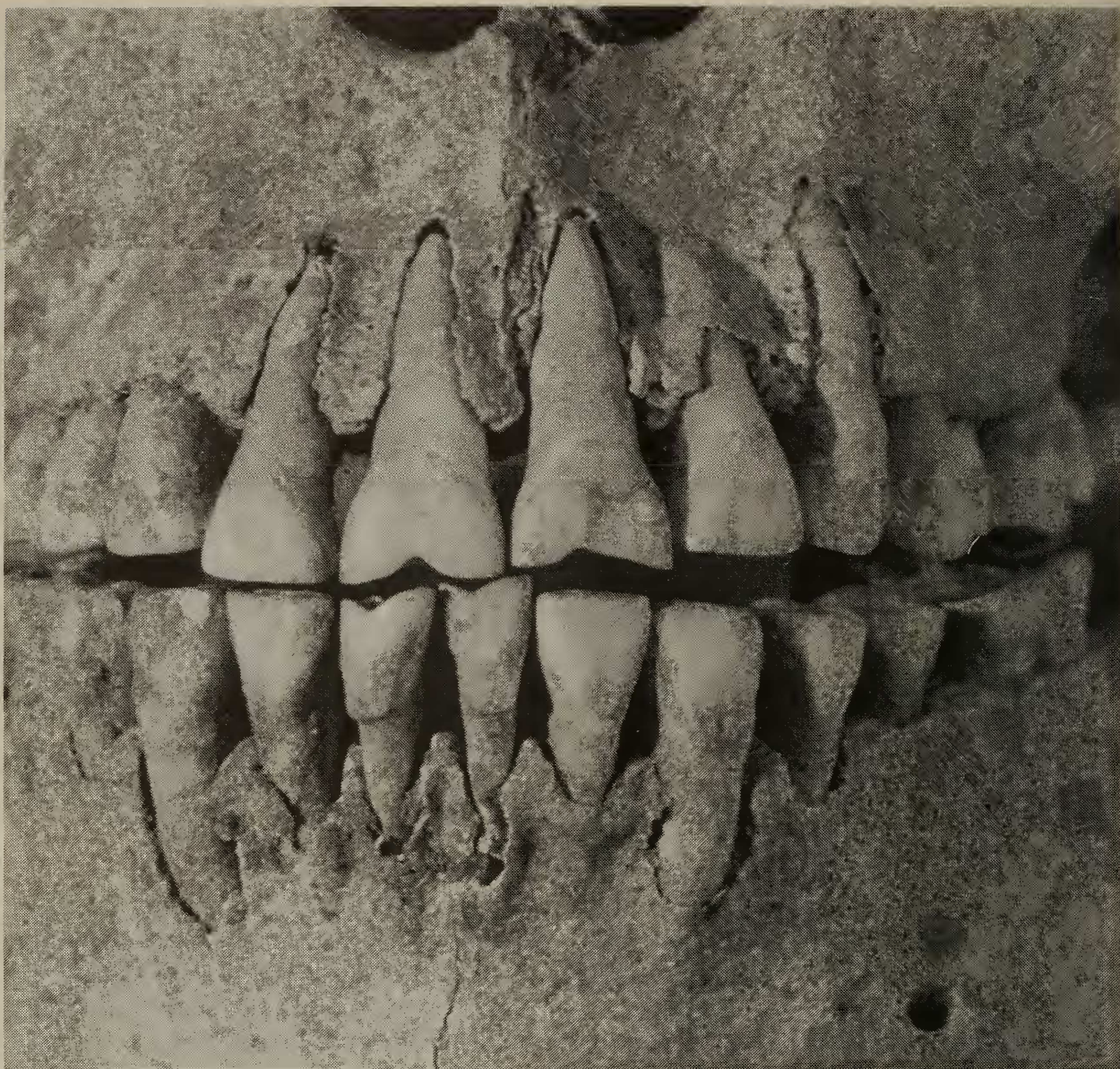


Fig. 6.—Close-up of the notched teeth of the Taylor Ranch Burial. Note that only 1 set of notches can match when held in a single position and that the maxillary notches are wider than those of the mandible.

the right first maxillary molar, which has an interproximal groove on the buccal-distal corner at the junction of the crown and root.

As in the case of the Taylor Ranch specimen, the mandible and teeth of the Gun Sight Shelter specimen were shipped to the second author and subsequently returned to the Panhandle-Plains Historical Museum.

Discussion

As mentioned before, there have been less than a dozen mutilated or possibly mutilated teeth reported from North

America. These teeth come from archeological contexts suggesting late time periods and areas of considerable Mesoamerican influence—late Puebloan from Arizona and Mississippian from Illinois and Georgia. The tooth modifications reported fall into 2 categories: namely, labial grooves and occlusal notches. Putting aside the question of the labial grooves and their possibly hypoplastic origins, the notched teeth can be divided into those with single notching and those with multiple. The Texas examples, of course, fall in the former category and are most similar to those from the Sikyatki Site in Arizona, which, perhaps signif-



Fig. 7.—Gun Sight Shelter mandibular fragment with 3 notched teeth: namely, right lateral and both central incisors. The mandible has been oriented to emphasize the notches.

icantly, is the geographically closest of the sites with reported mutilations.

There are essentially 2 methods by which the notched teeth from the Texas Panhandle could have been produced. One way is by purposeful filing presumably to alter the tooth form in a culturally prescribed manner. The other way is by accident. In this latter process, the teeth may have been used as tools, perhaps as a vise, to modify other objects that in turn altered the teeth themselves.

The notched teeth from the Texas Panhandle appear to result from intentional mutilation rather than the use of teeth as tools. In the case of the Taylor Ranch Burial, the sharp, clear-cut borders of the notches as well as the lack of juxtaposition between the mandibular and maxillary notches argue for mutilation. Although the Gun Sight Shelter notches are rounded and more groove-like than those of the Taylor Ranch Burial, these modifications can be explained by marked attrition. The notches probably represent the most apical aspect

of what was formerly a much larger notch before attrition destroyed the crown.

Like the notched teeth from the Sikyatki Site, the Texas examples are much less elaborate than most examples reported by Romero (1970) from Mexico or even the few reported examples from the eastern U. S. Some of the other U. S. examples involve multiple notches accompanied by labial grooves. Of course, the Texas examples once may have been more elaborate, before attrition destroyed most of the crowns.

The Texas examples appear to expand both the documented geographical and temporal ranges of notching in the United States. The geographical occurrence is somewhat surprising, since the Texas Panhandle lacks other evidence of significant direct Mesoamerican contact, although Southwestern influences may be present. The temporal extension is even more surprising, since all other examples of notching in the United States occur relatively late. The eastern examples are all from Mississippian sites,

dating no earlier than A.D. 700 and probably much later. The Arizona specimen dates very late, possibly into the historic period. As stated earlier, the Texas examples may be considerably earlier, possibly even Archaic. This new evidence suggests that the practice of notching in prehistoric North America may have had a considerably greater geographical and temporal range than previously suspected.

Acknowledgements

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ANNOUNCEMENT

WASHINGTON OPERATIONS RESEARCH COUNCIL

Wednesday, Jan. 19, 1977 "Planning and Evaluation in the Consumer Product Safety Commission." Joann Langston, Consumer Product Safety Comm.

Wednesday, Feb. 9, 1977 "Social Science Directions in the Current Administration." Arthur Spindler.

Wednesday, March 9, 1977 "Analysis of the Paperwork Flow in the Government." Warren Buhler, Staff Director, President's Commission to Reduce the Flow of Paperwork.

April 18-19, 1977 Annual Symposium. "Natural Resources Policy."

Wednesday, May 11, 1977 Annual Banquet.

All meetings will be held at the Center for Naval Analyses, 7th floor auditorium, 1401 Wilson Blvd., Arlington (Rosslyn) at 8:00 p.m.